A Collaborative Approach: Scientists and Commercial Fishermen Collecting Baseline Information in Marine Protected Areas

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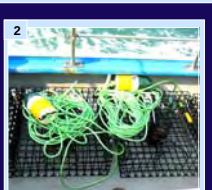

Project Overview

- Marine Protected Areas (MPAs) are increasingly being used as a marine resource conservation and management tool
- The effectiveness of MPAs is dependent upon the level of societal acceptance and stakeholder involvement
- We organized workshops with members of fishing, scientific, NGO, and management communities to develop a collaborative research project
- Together, we developed standardized protocols to gather MPA monitoring data using commercial trapping techniques
- In 2008, we surveyed the Año Nuevo, Point Lobos, Piedras Blancas, and Cambria MPAs (Figure 1) and corresponding reference sites
- Collaboration among scientists, fishermen, NGOs, and resource managers facilitates the development of shared perspectives on the status of marine resources and allows members of industry to play an active role in the assessment of MPAs

Figure 1. The MPAs (State Marine Reserves, SMRs, and State Marine Conservation Areas, SMCAs) that were surveyed for this project.

Survey Protocols

- Each MPA and reference pair was sampled 4 days per month for 3 months
- 500m x 500m grid cells were created in each MPA and corresponding reference site based on:
  - Fishermen knowledge
  - Bathymetry (less than 20m)
  - Substrate data (presence of rocky habitat)
  - Presence of kelp
- Each survey day, 2-4 grid cells were chosen at random and were sampled using commercial trapping techniques (Photo 1):
  - 2 strings of 10 individual traps were deployed in each grid cell (Photo 2)
  - Fishing locations within the cells were chosen by the captains
  - Traps were baited with 1 pint of squid and soaked for approximately 1 hour
- Captured fishes were identified to species, measured, tagged, and released (Photos 3-5)
- Captured Invertebrates were identified to species and released (Photo 6)
- Fishes exhibiting barotrauma were vented using a hypodermic needle and/or were released using a fish descending device

For more information about this study, visit:
http://seagrant.mlml.calstate.edu/research/ccfrp/ and
http://www.slosea.org/collaborative/

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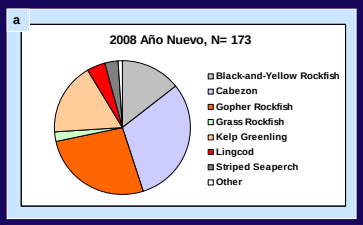
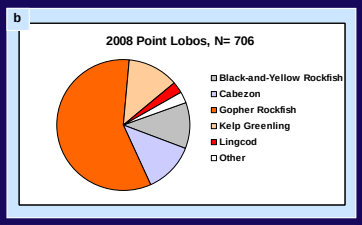
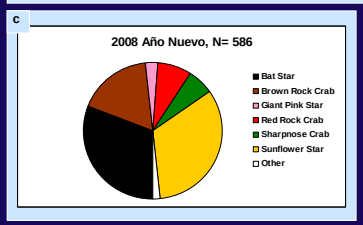






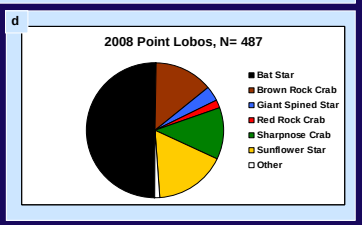
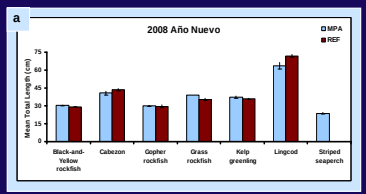


Figure 2. Species composition of fishes (a, b) and invertebrates (c, d) caught in the Año Nuevo and Point Lobos study areas.



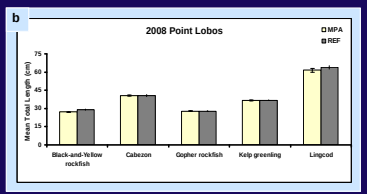


Figure 3. Mean lengths (cm) of the most abundant fishes in Año Nuevo (a) and Point Lobos (b) MPA and reference (REF) sites.

Results

- In 44 days of fishing, we caught nearly 2,600 fishes, and 3,000 invertebrates
- We generated information on fish catch rates, abundances, and size and species composition in the MPAs and reference (REF) sites (Table 1, Figures 2 & 3)
- Collected data will serve as a baseline to evaluate the efficacy of the MPAs in the future and may contribute to state and federal stock assessments
- The project fostered communication and mutual education among the scientific, management, and fishing communities
- The project demonstrates advantages of collaboration among scientists and members of the fishing community

	Año Nuevo			Point Lobos		
	All	MPA	REF	All	MPA	REF
No. Survey Days	12	6	6	12	6	6
No. Traps Set	537	261	276	381	225	156
Avg. ST (min)	60 (0.4)	60 (0.7)	61 (0.6)	68 (1.0)	63 (0.8)	74 (2.0)
Total Fish Caught	171	107	64	706	448	258
Fish CPUE	0.3 (0.0)	0.4 (0.0)	0.2 (0.0)	1.7 (0.1)	1.9 (0.1)	1.3 (0.1)

Table 1. Total number of survey days (No. Survey Days) and traps set (No. Traps Set), average soak time (Avg. ST, min), total fishes caught, and fish catch per trap-hour (Fish CPUE) in the Año Nuevo and Point Lobos MPA, reference (REF) and combined sites (All). Standard errors are in parentheses.